REMARKS

Claims 1-42 are currently pending in this application. Claims 1, 10, 11 and 14 have been amended herein, and claim 16 has been canceled. Support for claim amendments can be found, inter alia, in paragraph [0018] of the specification. Applicants respectfully have not amended claim 6 as objected to since it is noted that claim 6 does not refer to "elastomer/" but rather "elastomer."

DOUBLE PATENTING REJECTION

The Office Action provisionally rejects claim 1 on the ground of nonstatutory double patenting over claim 9 of copending application no. 10531998. According to the Office Action, the double patenting rejection is provisional because the cited application has not been patented and because the copending application and the instant application both claim a field grading material comprising a polymer matrix and a nanoparticle filler comprising less than 40% by volume of the field grading material.

In response, Applicants will respectfully defer the filing of a terminal disclaimer where required until such time as the rejection becomes nonprovisional due to the allowance of a claim in the present application or the copending application upon which the provisional rejection is based.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

Claim 10 is rejected under 35 U.S.C. § 112, second paragraph, on the basis that it recites 2 to 80 nm, and the claim also recites 5 to 50 nm and 5 to 30 nm which are narrower. Similarly, the Office Action points out that claim 11 recites several percentage by volumes with increasing narrower scope. In response, solely for the purpose of expediting prosecution, claims 10 and 11 have been amended herein to recite one range. In view of the above, Applicants respectfully request that rejection of claims 10 and 11 under 35 U.S.C. §112, second paragraph, be withdrawn.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102(e)

Claims 1, 4-15 and 17 are rejected under 35 U.S.C. § 102(e) as being anticipated by Nelson *et al.* (U.S. Patent Application Publication No. 2005/0027040; hereinafter "Nelson"). The Office Action alleges that Nelson discloses an organic-inorganic nanocomposite comprising: at least one organic polymer; and at least one surface-modified inorganic additive such as titanium dioxide, wherein said inorganic additive is less than about 100 nanometers in size and said organic-inorganic nanocomposite comprises about 50% or less inorganic additive by weight which reads on "less than 40% by volume."

In response, Applicants respectfully disagree. First, Applicants respectfully point out that a patent claim is anticipated by prior art if a single prior art reference discloses every limitation of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of Cal., 814 F.2d 628, 631 (Fed. Cir.1987). If a single claim limitation is missing from the reference, then the reference does not anticipate the claim. Atlas Powder Co. v. E.I. du Pont de Nemours & Co., 750 F.2d 1569 (Fed.Cir.1984).

Nelson discloses organic/inorganic nanocomposites and methods for their preparation. Nelson's method comprises the steps of providing an organic/inorganic concentrate and processing the concentrate with a polymer resin, or where the organic/inorganic concentrate and polymer resin are processed by extrusion using a single-screw extruder. Nelson's method discloses how to make a nanocomposite with one polymer phase and surface-modified nano-particles. Nelson's method teaches how to minimize agglomeration of nanoparticles during mixing nano-particles with a polymer by extrusion, thereby obtaining nano-particles that are well-dispersed throughout the polymeric matrix. In Nelson, before mixing the nano-particles with the polymer, an organic/inorganic concentration is formed by surface modifying the inorganic nano-particles by, for example, solution blending. The organic/inorganic concentration is thereafter mixed with a polymer by extrusion.

In contrast to the teaching of Nelson, the polymer matrix of the present invention comprises two or more polymer phases. Moreover and in further contrast to Nelson, the nanoparticles are heterogeneously distributed in the polymer matrix of the presently claimed invention. Since Nelson fails to teach or suggest a field grading material comprising a polymer matrix, wherein said polymer matrix has two or more polymer phases; and a field grading effective amount of a nanoparticle filler, wherein said filler is heterogeneously distributed in the polymer matrix, Nelson does not anticipate claim 1 of the present invention at least for these two reasons. In contrast to the presently claimed invention, Nelson is concerned with how to obtain well dispersed nano-particles throughout the polymer matrix.

Claim 14 as amended herein is directed to a field grading material comprising a nanoparticle filler that is heterogeneously distributed in a polymeric matrix. Nelson fails to anticipate claim 14 because, *inter alia*, Nelson discloses how to obtain well dispersed nano-particles throughout the polymer matrix. There is nothing in Nelson that would teach or suggest a field grading material comprising a nanoparticle filler that is heterogeneously distributed in a polymeric matrix, and therefore at least for this reason, claim 14 is not anticipated by Nelson.

With respect to rejected claims 4-13, which depend on claim 1, and claim 15, which depends on claims 14, it is respectfully pointed out that typically if an accused infringer does not infringe an independent claim, it cannot infringe any claim that depends from the independent claim. Wahpeton Canvas Co. v. Frontier, Inc., 870 F.2d 1546 (Fed. Cir. 1989).

Thus, in view of the above, Applicants respectfully request that rejection of claims 1, 4-15 and 17 under 35 U.S.C. § 102(e) as being anticipated by Nelson be withdrawn.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102(b)

Claim 16 is rejected under 35 U.S.C. § 102(b) as being anticipated by Foulger (U.S. Patent No. 6,417,265; hereinafter "Foulger"). The Office Action alleges Foulger anticipates claim 16 of the present invention because it discloses a conducting polymer composite comprising a polymeric material and a conducting filler such as carbon nanotube.

In response, Applicants respectfully disagree, however, without acceding to the propriety of the rejection and solely to expedite prosecution of the present application, Applicants have herein canceled claim 16. Applicants reserve the right to pursue the subject matter of any canceled claim in one or more related applications. In view of the above, Applicants respectfully request that rejection of claim 16 under 35 U.S.C. §102(b) be withdrawn.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 103(a)

Claims 2 and 3 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nelson in view of Bernhoff *et al.* (U.S. Patent Application Publication No. 2002/0070428; hereinafter "Bernhoff"). In particular, the Examiner alleges that although Nelson is silent on the use of specific nanoparticle filler, paragraphs 3, 32, 36 and 37 of Bernhoff disclose a semiconductive device comprising a field grading material comprising a polymer based material filled with particles of BaTiO3, TiO3, Al2O3, MgO, ZnO or SiC. The Office Action contends that it would therefore be obvious to one of ordinary skill in the art at the time the invention was made to produce a field grading material using the specific nanoparticle filler.

NELSON

Nelson discloses organic/inorganic nanocomposites and methods for their preparation. Nelson's method comprises the steps of providing an organic/inorganic concentrate and processing the concentrate with a polymer resin, or where the organic/inorganic concentrate and polymer resin are processed by extrusion using a single-screw extruder. Nelson's method further comprises surface modifying an inorganic additive, mixing the modified additive with a polymer solution to produce an organic/inorganic solution, and removing the solvent from the organic/inorganic solution to produce the organic/inorganic concentrate. According to Nelson, the processing of the organic/inorganic concentrate with a polymer resin produces a homogeneous nanocomposite with superior mechanical and thermal properties.

BERNHOFF

Bernhoff discloses a semiconductor device comprising means for grading an electric field created in the active part of the device when a high voltage is applied across it. The means disclosed in Bernhoff comprises a member being of a material having a higher dielectric constant than the material of said active part and applied next to at least a portion of said active part where a high electric field occurs when a high voltage is applied across the device for obtaining a field grading for a condition of changing of the voltage.

NELSON IN VIEW OF BERNHOFF

Nelson discloses organic/inorganic nanocomposites and methods for their preparation. Nelson's method comprises the steps of providing an organic/inorganic concentrate and processing the concentrate with a polymer resin, or where the organic/inorganic concentrate and polymer resin are processed by extrusion using a single-screw extruder. Nelson's method discloses how to make a nanocomposite with one polymer phase and surface-modified nano-particles. Nelson teaches a method of how to minimize agglomeration of nanoparticles during mixing nano-particles with a polymer by extrusion, and thereby obtain nano-particles that are well-dispersed throughout the polymeric matrix. In Nelson, before mixing the nano-particles with the polymer, an organic/inorganic concentration is formed by surface modifying the inorganic nano-particles by, for example, solution blending. The organic/inorganic concentration is thereafter mixed with a polymer by extrusion.

Nelson fails to teach a field grading material, as presently taught. In Nelson, the purpose of the surface modification of nanoparticles and the described mixing process of the surface-modified nanoparticles (organic/inorganic concentrate) with a polymer is to obtain a good dispersion of the filler in the polymer. This item is discussed in present application in the context of conventional nanocomposites (see paragraph [0016]). Paragraph [0016], however, also describes the *heterogeneous* distribution of particles according to the present invention. In contrast to the teaching of Nelson, the polymer matrix of the present invention comprises two or more polymer phases and the nanoparticles are heterogeneously distributed in the polymer

matrix of the presently claimed invention. Applicants respectfully point out that having particles heterogeneously distributed in the matrix provides for improved mechanical and electrical properties of the field grading material.

Nelson would not lead a person of ordinary skill in the art to a field grading material, or nanocomposite, where the filler is heterogeneously distributed in the polymer matrix, let alone teaching or suggesting a field grading material comprising a polymer matrix, wherein said polymer matrix has two or more polymer phases; and a field grading effective amount of a nanoparticle filler, wherein said filler is heterogeneously distributed in the polymer matrix such that the nanoparticle filler is well dispersed in at least part of one of said polymer phases; and wherein said filler comprises less than 40% by volume of said field grading material. On the contrary, Nelson discloses obtaining well dispersed nano-particles throughout the polymer matrix and teaches away from the presently claimed invention.

Moreover, the deficiencies of Nelson are not remedied by Bernhoff. There is no incentive for a skilled artisan to look in Bernhoff as it is not concerned with nanoparticles in a polymeric matrix, nor would the skilled artisan find the solution in Bernhoff, as it discloses a conventional field grading material with one polymer phase and a particulate filler. Nothing is mentioned in Bernhoff about the particles in the polymer of the field grading material being nanoparticles or about the distribution of the particles in the polymer, see paragraph [0037]. (When nanoparticles are mentioned in Bernhoff, they are mentioned in connection with water as matrix, *see* paragraph [0038]).

Additionally, since Nelson teaches how to obtain a nanocomposite where the filler is well dispersed throughout the matrix, and also states the necessity of obtaining this, a combination of Nelson and Bernhoff would lead the skilled artisan to make the dispersion of the filler in the field grading material of Bernhoff as homogenous as possible throughout the matrix, *i.e.* a combination of Nelson and Bernhoff would teach away from the present invention. An obviousness rejection may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. In re Geisler, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nelson in view of Bernhoff. In particular, the Examiner alleges that although Nelson is silent on the use in cable terminal, paragraphs 3, 32, 36, 37 and 41 of Bernhoff disclose a semiconductive device comprising a field grading material comprising a polymer based material filled with particles of BaTiO3, TiO3, Al2O3, MgO, ZnO or SiC, wherein the device is used as a powder cable terminal. The Office Action contends that it would therefore be obvious to one of ordinary skill in the art at the time the invention was made to produce a field grading material to be used in a cable terminal.

The deficiencies of Nelson are discussed *supra*. Bernhoff does not remedy Nelson's deficiencies because, *inter alia*, Bernhoff fails to mention a cable termination and claim 18 seeks protection for reducing electric field stress at a termination for an electrical cable, also called cable end. In contrast, Bernhoff's terminal is arranged around a contact in a semiconductor device. As such, at least for this reason, dependent claim 18 is also new and nonobvious over Nelson in view of Bernhoff.

A PHOSITA would not have recognized that the results of the combination were predictable, and indeed there would have been no reasonable expectation of success to arrive at the present invention by combining the teachings of Nelson and Bernhoff, as outlined *supra*. A prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Here, at least for the reasons outlined *supra*, Nelson in view of Bernhoff would lead away from the claimed invention.

The Supreme Court in the KSR decision stated that the analysis supporting a rejection for obviousness be made explicit and that rejections can not be sustained by mere conclusory statements but, instead, there must be an articulated reason with some rational underpinning to support the legal conclusion of obviousness. The USPTO lists seven rationales, including a) combining prior art elements according to known methods to yield predictable results, and b) simple substitution of one known element for another to obtain predictable results. Here, a

PHOSITA would not have recognized that the results of combining Nelson with Bernhoff were predictable for the reasons outlined above, and therefore for this additional reason, the obviousness rejection based upon combining the primary Nelson reference with Bernhoff is improper and should be withdrawn.

Accordingly, for the reasons stated above, claims 2, 3 and 18 are not rendered obvious by Nelson in view of Bernhoff. Accordingly, withdrawal of the rejection under U.S.C. §103(a) is respectfully requested.

CONCLUSION

There being no other outstanding issues, it is believed that the application is in condition for allowance, and such action is respectfully requested. Should the Examiner believe that anything further is desirable in order to place the application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

The undersigned hereby authorizes the Commissioner to charge any fee insufficiency and credit any overpayment associated with this submission to Deposit Account No. 08-1935.

Respectfully submitted,

/Shahrokh Falati/

Date: April 7, 2010

Shahrokh Falati, Ph.D.
Attorney for Applicants
Registration No. 58,160

Please address correspondence to:
Heslin Rothenberg Farley & Mesiti P.C.
5 Columbia Circle
Albany, NY 12203
Tel.: 518-452-5600
Fax: 518-452-5579
Customer No.: 23,405
Deposit Account No.: 08-1935